APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/719,180	11/20/2003	Karl A. Nielsen	TUC920030162US1	3228

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LAW OFFICE OF DAN SHIFRIN, PC - IBM	SZETO, JACK W
14081 WEST 59TH AVENUE	

ART UNIT	PAPER NUMBER
2113	

ARVADA, CO 80004

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Please find below and/or attached an Office communication concerning this application or proceeding.

	Application No.	Applicant(s)
Office Action Summary	10/719,180	NIELSEN ET AL.
	Examiner	Art Unit	
	Jack W. Szeto	2113	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on _20 November 2003_.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) _1-28_ is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) _1-28_ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on _20 November 2003_ is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All   b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.

5)☐ Notice of Informal Patent Application (PTO-152)

6)☐ Other: _____.

Non-Final Official Action

Status of the Specification and Claims

Claims 10-11 are rejected under 112 2nd paragraph.

Claims 1-5, 8-12, and 15-19 are rejected under 102(e).

Claims 6-7, 13-14, and 20-28 are rejected under 103(a).

Claim Rejections - 35 USC § 112, 2nd Paragraph

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 10 and 11 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 10 recites "means for in the reconstructed...". This limitation does not make sense. However, the examiner interprets it as "means for detecting errors in..." for purposes of further art rejection and compact prosecution. Also, examiner interprets the "the means for transmitting the third command..." in claim 11 as being the same as the implied "means for transmitting" in claim 10. Appropriate corrections are required. Claim 11 inherits this rejection.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-5, 8-12, and 15-19 are rejected under 35 U.S.C. 102(e) as being anticipated by Fredin (United States Patent Publication No. 2004/0268178).

As per claim 1, Fredin:

A method for controlling a RAID subsystem, comprising:

transmitting a first command to a RAID controller to read a block of data [para 0025 and Figure 2: read command sent from host to retrieve data from storage] from an array of storage drives [para 0018 and 0023: access and control of the RAID system through controller in communication with a host computer assembly];

receiving the block of data from the RAID controller [para 0025: data received by host through controller];

detecting errors in the block of data received from the RAID controller [para 0025: data checked for error];

if an error is detected, transmitting a second command to the controller to perform a first reconstruct read of the block of data [para 0025: error detected and second command (RRD command) to reconstruct read data by reading a different copy]; and

receiving the reconstructed block of data [para 0025: reconstructed data received by host].

As per claim 2, Fredin:

The method of claim 1, wherein:

the first command includes an instruction directing the RAID controller to use a first of a

plurality of reconstruct read algorithms [Figure 2: first read command]; and

the second command includes an instruction directing the RAID controller to use a

second one of the plurality of reconstruct read algorithms [Figure 2, para 0025 and 0029: second

command is a RRD command which includes using parity techniques to reconstruct data].

As per claim 3, Fredin:

The method of claim 1, further comprising:

detecting errors in the reconstructed block of data [Figure 2 and para 0026: detecting

errors in reconstructed data]; and

if an error is detected in the reconstructed block of data, transmitting a third command to

the RAID controller to perform a second reconstruct read of the block of data using an algorithm

different from the algorithm used to perform the first reconstruct read [para 0025 and figure 2: if

errors are detected in the newly reconstructed data, the index is compared to the count, then

another copy of the data is read. According to applicant's specification, the "reconstruction"

algorithm of data includes reading from another hard drive (applicant's specification, para

0017)].

As per claim 4, Fredin:

The method of claim 3, wherein:

the second command includes an instruction directing the RAID controller to read the block of data from a first of two copies of the block of data [para 0025: second command (RRD reads a first copy of multiple copies of data]; and

the third command includes an instruction directing the RAID controller to read the block of data from a second of the two copies [para 0025: third command (RRD reads another copy of multiple copies of data].

As per claim 5, Fredin:

The method of claim 1, wherein:

the first command includes an instruction directing the RAID controller to read the block of data from a first of two copies of the block of data [para 0025: first command reads a a first copy of multiple copies of data]; and

the second command includes an instruction directing the RAID controller to read the block of data from a second of the two copies of the block of data [para 0025: second command reads another copy of multiple copies of data].

Claim 8 claims the same subject matter as claim 1. Claim 8 is the "means for" interpretation for of claim 1. Thus the rejection of claim 1 will be used as an example for the rejection of claim 8.

Claim 9 claims the same subject matter as claim 2. Claim 9 is the "means for"

interpretation for of claim 2. Thus the rejection of claim 2 will be used as an example for the

rejection of claim 9.

Claim 10 claims the same subject matter as claim 3. Claim 10 is the "means for"

interpretation for of claim 3. Thus the rejection of claim 3 will be used as an example for the

rejection of claim 10.

Claim 11 claims the same subject matter as claim 4. Claim 11 is the "means for"

interpretation for of claim 4. Thus the rejection of claim 4 will be used as an example for the

rejection of claim 11.

Claim 12 claims the same subject matter as claim 5. Claim 12 is the "means for"

interpretation for of claim 5. Thus the rejection of claim 5 will be used as an example for the

rejection of claim 12.

Claim 15 claims the same subject matter as claim 1. Claim 15 is the "computer program

product of a computer readable medium usable with a programmable computer" interpretation

for of claim 1. Thus the rejection of claim 1 will be used as an example for the rejection of claim

15.

Claim 16 claims the same subject matter as claim 2. Claim 16 is the "computer program

product of a computer readable medium usable with a programmable computer" interpretation

for of claim 2. Thus the rejection of claim 2 will be used as an example for the rejection of claim

16.

Claim 17 claims the same subject matter as claim 3. Claim 17 is the "computer program

product of a computer readable medium usable with a programmable computer" interpretation

for of claim 3. Thus the rejection of claim 3 will be used as an example for the rejection of claim

17.

Claim 18 claims the same subject matter as claim 4. Claim 18 is the "computer program

product of a computer readable medium usable with a programmable computer" interpretation

for of claim 4. Thus the rejection of claim 4 will be used as an example for the rejection of claim

18.

Claim 19 claims the same subject matter as claim 5. Claim 19 is the "computer program

product of a computer readable medium usable with a programmable computer" interpretation

for of claim 5. Thus the rejection of claim 5 will be used as an example for the rejection of claim

19.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 6, 13, 20, and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Fredin (United States Patent Publication No. 2004/0268178).

As per claim 6, Fredin does not fully disclose:

The method of claim 5, further comprising *comparing the first read block of data with the*

reconstructed block of data.

Fredin discloses:

The method of claim 5, further comprising comparing the first read block of data with the

reconstructed block of data [Figure 3 and para 0026: in another exemplary method, the first

block of data is compared to other copies of data (reconstructed) in the system].

In Figure 3, when the first data is found to contain errors, it is sent back to a controller

and the controller compares the data to other copies. It is inherent for the controller to make a

comparison, the copies must be read (reconstructed data) from the drives. Comparing a first data

block (with errors) to another reconstructed data block can be used to validate the reconstructed

data. If the reconstructed data is the same as first data, it will contain the same errors. Thus it

would have been obvious to one of ordinary skill in the art at the time of invention to have the

method to include comparing the first data to the reconstructed data as taught in Fredin.

Claim 13 claims the same subject matter as claim 6. Claim 13 is the "means for"

interpretation for of claim 6. Thus the rejection of claim 6 will be used as an example for the

rejection of claim 13.

Claim 20 claims the same subject matter as claim 6. Claim 20 is the "computer program

product of a computer readable medium usable with a programmable computer" interpretation

for of claim 6. Thus the rejection of claim 6 will be used as an example for the rejection of claim

20.

Claim 27 claims the same subject matter as claim 6. Claim 27 is the "RAID subsystem"

interpretation for of claim 6. Thus the rejection of claim 6 will be used as an example for the

rejection of claim 27.

Claims 7, 14, 21, and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Fredin (United States Patent Publication No. 2004/0268178), and further in view of Kedem

(United States Patent N. 6,154,853).

As per claim 7, Fredin does not discloses:

The method of claim 1, further comprising, following detection of an error, *providing an*

indication of the error whereby a faulty drive may be replaced.

Kedem discloses:

The method of claim 1, further comprising, following detection of an error, providing an

indication of the error whereby a faulty drive may be replaced [column 2, line 3-10: after an

amount of error, the faulty drive is indicated as a failure to be replaced].

Both Kedem and Fredin disclose array storage systems. Fredin does not disclose

indicating a faulty drive may be replaced, while Kedem does. Having an indication of a faulty

drive so it may be replace increases reliability of a system. Thus it would have been obvious to one of ordinary skill in the art at the time of invention to have an indication for a faulty drive as taught by Kedem in to the storage system of Fredin to create a system with increase reliability.

Claim 14 claims the same subject matter as claim 7. Claim 14 is the "means for" interpretation for of claim 7. Thus the rejection of claim 7 will be used as an example for the rejection of claim 14.

Claim 21 claims the same subject matter as claim 7. Claim 21 is the "computer program product of a computer readable medium usable with a programmable computer" interpretation for of claim 7. Thus the rejection of claim 7 will be used as an example for the rejection of claim 21.

Claim 28 claims the same subject matter as claim 7. Claim 28 is the "RAID subsystem" interpretation for of claim 7. Thus the rejection of claim 7 will be used as an example for the rejection of claim 28.

Claims 22-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fredin (United States Patent Publication No. 2004/0268178), and further in view of Matsumoto (United States Patent N. 5,655,150).

As per claim 22, Fredin discloses:

A RAID subsystem, comprising:

a plurality of RAID storage drives [para 0018];

a RAID controller coupled to the RAID storage drives and to a host device [para 0018: host in communication with an array controller of RAID system]; and

a processor programmed with instructions for:

receiving a first command from the host device to read a block of data [para 0025 and Figure 2: read command sent from host to retrieve data from storage] from an array of storage drives [para 0018 and 0023: access and control of the RAID system through controller in communication with a host computer assembly];

obtaining the block of data from the RAID drives [para 0025: data received by host through controller];

transmitting the block of data to the host device [para 0025: data received by host from controller];

if the host device detects an error in the transmitted block of data, receiving a second command from the host device to perform a first reconstruct read of the block of data; obtaining the reconstructed block of data from the RAID drives [para 0025: error detected and second command (RRD command) to reconstruct read data by reading a different copy]; and

transmitting the reconstructed block of data to the host device [para 0025: reconstructed data received by host from controller].

Fredin does not explicitly disclose:

a processor programmed with instructions for;

Matsumoto discloses:

a processor programmed with instructions [Figure 2, reference 3: microprocessor within

the controller]

Both Fredin and Matsumoto are storage array systems. While Fredin does not explicitly

disclose having a processor in the controller, Matsumoto does. While Fredin also strongly hinted

at the controller having processing capabilities [para 0023], it is not inherent. Although, having a

processor in the controller allows for autonomy and efficiency. Thus it would have been obvious

at the time of invention to incorporate a processor in the controller as taught in Matsumoto into

the system of Fredin to create a more autonomous and efficient storage system.

Claim 23 claims the same subject matter as claim 2. Claim 23 is the "RAID subsystem"

interpretation for of claim 23. Thus the rejection of claim 2 will be used as an example for the

rejection of claim 23.

Claim 24 claims the same subject matter as claim 3. Claim 24 is the "RAID subsystem"

interpretation for of claim 3. Thus the rejection of claim 3 will be used as an example for the

rejection of claim 24.

Claim 25 claims the same subject matter as claim 4. Claim 25 is the "RAID subsystem"

interpretation for of claim 4. Thus the rejection of claim 4 will be used as an example for the

rejection of claim 25.

Claim 26 claims the same subject matter as claim 5. Claim 26 is the "RAID subsystem"

interpretation for of claim 5. Thus the rejection of claim 5 will be used as an example for the

rejection of claim 26.

Conclusion

Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Jack W. Szeto whose telephone number is (571) 272-1537. The

examiner can normally be reached on M-F 8 am - 5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Robert Beausoliel can be reached on (571) 272-3645. The fax phone number for the

organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent

Application Information Retrieval (PAIR) system. Status information for published applications

may be obtained from either Private PAIR or Public PAIR. Status information for unpublished

applications is available through Private PAIR only. For more information about the PAIR

system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR

system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

jws

BRYCE P. BONZO
PRIMARY EXAMINER